

REMARKS

Claims 1-10, 12-38, and 40-64 are pending. New claims 65-70 are presented. Claims 1, 4, 29, 53, and 58 are amended. Applicants do not acquiesce to rejections set forth in the Office Action and reserve the right to pursue previously pending claims.

Claims 1-10 and 12-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent no. 6,392,752 to Johnson ("Johnson '752") in view of U.S. patent no. 6,628,370 to McCullough et al. ("McCullough"), and in further view of U.S. patent no. 6,485,413 to Bopart ("Bopart").

As amended herein, claim 1 recites imaging, with a magnification of less than 1, light reflected from the measurement surface onto a multi-element detector through an optical system comprising at least one focusing optic and a lenslet array, the at least one focusing optic positioned along an optical path between the measurement surface and the lenslet array.

Johnson '752 does not disclose or suggest the imaging including at least one focusing optic positioned along an optical path between a measurement surface and a lenslet array. For example, no focusing optic is disposed between microlens array 102 and the sample 106 of Fig. 1. Moreover, it is submitted that there is no motivation in the cited art to modify Johnson '752 to even attempt the method of claim 1. It is submitted that claim 1 is non-obvious for at least this reason with respect to the cited art so that the rejection of claim 1 and dependent claims 2-10 and 12-23 has been overcome.

With respect to claim 24, we respectfully request that the Examiner point to disclosure of the cited references alleged to form a basis for the rejection over the combination of Johnson '752, McCullough, and Bopart. We submit that no combination of the cited references discloses or suggests claim 24.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752 and McCullough as applied to claim 1 and further in view of U.S. patent no. 5,133,601 to Cohen et al. ("Cohen").

Claim 12 depends from claim 1. We submit that no combination of Johnson '752, McCullough, and Cohen discloses or suggests the invention of claim 1, let alone dependent claim

12.

Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752 and McCullough as applied to claim 1 and further in view of U.S. patent no. 6,133,986 to Johnson ("Johnson '986").

Claim 15 depends from claim 1. We submit that no combination of Johnson '752, McCullough, and Johnson '986 discloses or suggests the invention of claim 1, let alone dependent claim 15.

Claims 18 and 19 were rejected under U.S.C. § 103(a) as being unpatentable over Johnson '752 and McCullough as applied to claim 1 and further in view of U.S. patent no. 6,493,093 to Harasaki et al. ("Harasaki").

Claims 18 and 19 depend from claim 1. We submit that no combination of Johnson '752, McCullough, and Harasaki discloses or suggests the invention of claim 1, let alone dependent claims 18 or 19.

Claims 29-38, 40, 41, 43, 44, and 47-51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752 and McCullough, and in further view of Bopart.

Independent claim 29 recites an interferometry system that comprises an optical system comprising a lenslet array and a focusing optic, the lenslet array comprising a plurality of elements, the focusing optic disposed along an optical path between the lenslet array and the measurement surface, the focusing optic configured to receive light from elements of the lenslet array, the optical system configured to image the light reflected from the measurement surface onto the detector.

Johnson '752 does not disclose a focusing optic between the lenslet array and the measurement surface as recited in claim 29. For example, no focusing optic is disposed between microlens array 102 and the sample 106 of Fig. 1. Moreover, it is submitted that there is no motivation in the cited art to modify Johnson '752 to even attempt an interferometry system comprising a focusing optic disposed between an lenslet array and a measurement surface, the focusing optic configured to receive light from elements of the lenslet array. Accordingly, it is submitted that claim 29 is non-obvious with respect to the cited art so that the rejection of claim

29 and dependent claims 38, 40, 41, 43, 44, and 47-51 has been overcome.

Claim 42 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752, McCullough, and Bopart as applied to claim 29 and in further view of Johnson '986.

As discussed above, independent claim 29 is non-obvious with respect to the cited art. Johnson '986, like the other cited art, provides no motivation to modify Johnson '752 to even attempt the interferometry system of claim 29. For at least this reason, claim 42, which depends from independent claim 29, is submitted to be patentable over the cited art.

Claims 45 and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752, McCullough, and Bopart as applied to claim 29 and in further view of Harasaki.

As discussed above, independent claim 29 is non-obvious with respect to the cited art. Harasaki, like the other cited art, provides no motivation to modify Johnson '752 to even attempt the interferometry system of claim 29. For at least this reason, claims 45 and 46, which depend from independent claim 29, are submitted to be patentable over the cited art.

Claims 56 and 57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson '752.

Claim 56 recites that the numerical aperture converter of the lens system is configured to receive the optical interference pattern and form a virtual image thereof. Claim 57 recites forming a virtual image of the optical interference pattern.

Johnson '752 does not disclose or suggest forming a virtual image of an interference pattern.

For at least this reason, claims 56 and 57 are submitted to be non-obvious over the cited art.

Claims 58 and 59 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. patent no. 5,760,901 to Hill ("Hill").

As amended herein, independent claim 58 recites an interferometry method, comprising:

- preparing, from a common source beam, a plurality of sub-beams;
- relaying, using an optical system comprising at least one focusing element, a first portion of each sub-beam to a respective,

different location of a measurement surface and a second portion of each sub-beam to a respective, different location of a reference surface;

combining light reflected from the measurement surface and light reflected from the reference surface; and
detecting the combined light.

Hill discloses focusing beams to a common location, not to respective, different locations of a measurement or reference surface. Hence, Hill cannot anticipate claims 58 and 59.

It is submitted that the rejection of claim 58 and dependent claim 59 has been overcome.

Claims 24-28 and 53-64 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. patent no. 5,962,852 to Knuettel et al. ("Knuettel").

The apparatus of Knuettel have a plurality of optical sources, e.g., fibre optics 33 or transmitters 10. Knuettel, 5:30-45; 11:28-33; and Figs. 1 and 5. A beam splitter cube receives a respective beam (primary light 14) from each light source and prepares a separate measurement beam and a separate reference beam from each primary light 14. *Id.*

Independent claims 24 and 58, recite preparing, from a common source, an array of sub-beams. Independent claim 61 recites an interferometer, comprising a lenslet array configured to prepare a plurality of sub-beams from a common source beam. Where Knuettel discloses apparatus that prepare only a single reference and a single measurement beam from a given source, Knuettel cannot disclose or suggest the inventions of claims 24, 58, and 61.

Claim 53 recites an interferometry system for profiling a measurement surface, the system comprising:

a multi-element detector; and
an interferometer which during operation directs a measurement beam to contact the measurement surface and a reference beam to contact a reference surface, and images light reflected from the measurement surface to overlap on the multi-element detector with light reflected from the reference surface, wherein the measurement and reference beams are derived from a common source and wherein the interferometer includes an optical system comprising a lenslet array and an optical relay positioned along an optical path intermediate the measurement surface and the lenslet array to direct the measurement beam to contact the measurement surface as an array of focused spots, each spot comprising light

derived from the common source, the optical relay comprising at least one lens.

As discussed above, the apparatus of Knuettel have a plurality of optical sources, e.g., fibre optics 33 or transmitters 10. Knuettel, 5:30-45; 11:28-33; and Figs. 1 and 5. Light from each source is brought to a different focus 17. *Id.*, Figs. 1 and 5. No focus 17 is understood to include light derived from more than one fibre optic or transmitter. Hence, the apparatus of Knuettel do not disclose or suggest the system of claim 53, which forms an array of focused spots, each spot comprising light derived from the common source.

Applicant submits that the rejection of claim 53 has been overcome.

With respect to claim 56, Knuettel does not disclose or suggest an interferometric system comprising a lens system including a numerical aperture converter and at least one focusing element, the lens system configured to transmit the light beam from the light source to an interferometer, the numerical aperture converter of the lens system configured to receive an optical interference pattern and form a virtual image thereof, the at least one focusing element configured to image the virtual image of the optical interference pattern onto a detector.

With respect to the method of claim 57, Knuettel does not disclose forming a virtual image of an optical interference pattern and imaging the virtual image of the optical interference pattern onto a detector via a lens system.

For at least these reasons, Applicant respectfully submits that Knuettel does not disclose or suggest the invention of claims 56 and 57.

Claim 63 recites forming a virtual image comprising light reflected from the measurement surface and light reflected from the reference surface, the virtual image being spaced apart from the measurement and reference surfaces. Knuettel does not disclose or suggest forming such a virtual image.

It is believed that the rejections in the Office Action have been overcome for at least the reasons presented herein. Furthermore, it is submitted that no combination of the cited art discloses or suggests the respective inventions of new dependent claims 65-70. Thus, the claims as presented and amended herein are submitted to be in condition for allowance.

Applicant : Peter de Groot
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Page : 20 of 20

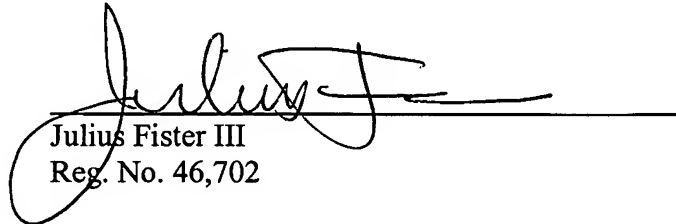
Attorney's Docket No.: 09712-055001 / Z-200

If the Examiner wishes to discuss this case, then Applicants respectfully request a personal or telephonic interview to discuss any remaining issues and expedite the allowance of the application

Enclosed is a \$162.00 check for excess claim fees and a \$980.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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